

Abstract

The invention relates to a mass spectrometer comprising an ion source for producing a primary ion beam, which has a heatable ion emitter coated by a liquid metal layer essentially comprised of pure metallic Bismuth or of a low-melting-point alloy containing, in essence, Bismuth. A Bismuth ion mixed beam can be emitted by the ion emitter under the influence of an electric field. From the Bismuth ion mixed beam, one of a number of Bismuth ion types whose mass is a multiple of monatomic singly or multiply charged Bismuth ions Bi_1^{p+} , is to be filtered out in the form of a mass-pure ion beam that is solely comprised of ions of a type Bi_n^{p+} , in which $n \geq 2$ and $p \geq 1$, and n and p are each a natural number.